

Amendments to the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1-21. (canceled)

22. (currently amended) A communication network comprising:

a host network;

a plurality of base stations;

at least a mobile host capable of establishing links to said base stations; and

a hierarchy-network of plural router-sets providing multiple-point routings between said base stations and said host network,

wherein each of said router-sets further includes plural associated routers which provide the same communication route and which have the same routing information, and a normally selected one of said associated routers in each router set is operational to provide said communication route, and if said normally selected one of said associated routers becomes inoperational, then another of said associated routers is selected to be operational to provide said communication route, thereby allowing continuous communication between said at least mobile host and said host network, [[and]]

wherein selection of one of said associated routers in each router set is made by a selected higher level router which manages said associated routers, and

wherein the normally selected one of said associated routers in each router set sends said selected higher level router a message indicating that said normally selected one of said associated routers is operational, and if said selected higher level router has not received said message from said normally selected one of said associated routers in a predetermined time period, then said selected higher level router judges that said normally selected one of said associated routers has become inoperational, and said selected higher level router selects the another of said associated routers to provide the same communication route.

23-25. (canceled)

26. (original) The communication network as claimed in claim 22, wherein all of said associated routers update the same routing information themselves based on a position recording message of said at least mobile host which has been transferred through a selected lower level router which is managed by selected one of said associated routers, and said selected one of said associated routers further transfers said position recording message to all of higher level associated routers which are capable of managing said associated routers.

27. (currently amended) A method of controlling a communication network that includes a host network; a plurality of base stations; at least a mobile host capable of establishing links to said base stations; and a hierarchy-network of plural router-sets providing multiple-point routings between said base stations and said host network, each of said router-sets further including plural associated routers which provide the same communication route and which have the same routing information, the method comprising the steps of:

~~wherein a normally selected~~ normally selecting one of said associated routers in each router set is operational to provide said communication route; ~~and if said normally selected one of said associated routers becomes inoperational,~~ then

selecting another of said associated routers ~~is selected~~ to be operational to provide said communication route when said normally selected one of said associated routers becomes inoperational, thereby allowing continuous communication between said at least mobile host and said host network, [[and]] wherein selection of one of said associated routers in each router set is made by a selected higher level router which manages said associated routers;

sending from the normally selected one of said associated routers in each router set to said selected higher level

router a message indicating that said normally selected one of said associated routers is operational;

judging by said selected higher level router that said normally selected one of said associated routers has become inoperational when said selected higher level router has not received said message from said normally selected one of said associated routers in a predetermined time period; and

selecting by said selected higher level router the another of said associated routers to provide the same communication route.

28-30. (canceled)

31. (currently amended) The ~~communication network~~ method as claimed in claim 27, further comprising the steps of ~~wherein~~ all of said associated routers ~~update~~ updating the same routing information themselves based on a position recording message of said at least mobile host which has been transferred through a selected lower level router which is managed by selected one of said associated routers, and transferring by said selected one of said associated routers ~~further transfers~~ said position recording message to all of higher level associated routers which are capable of managing said associated routers.

32. (currently amended) A hierarchy-router-network of plural router-sets providing multiple-point routings between a

plurality of base stations establishing links to at least a mobile host and a host network,

wherein each of said router-sets further includes plural associated routers which provide the same communication route and which have the same routing information, and a normally selected one of said associated routers in each router set is operational to provide said communication route, and if said normally selected one of said associated routers becomes inoperational, then another of said associated routers is selected to be operational to provide said communication route, thereby allowing continuous communication between said at least mobile host and said host network, [[and]]

wherein selection of one of said associated routers in each router set is made by a selected higher level router which manages said associated routers,

wherein all of said associated routers update the same routing information themselves based on a position recording message of said at least mobile host which has been transferred through a selected lower level router which is managed by selected one of said associated routers, and said selected one of said associated routers further transfers said position recording message to all of higher level associated routers which are capable of managing said associated routers.

33-34. (canceled)

35. (previously presented) The hierarchy-router-network as claimed in claim 32, wherein the normally selected one of said associated routers in each router set sends said selected higher level router a message indicating that said normally selected one of said associated routers is operational, and if said selected higher level router has not received said message from said normally selected one of said associated routers in a predetermined time period, then said selected higher level router judges that said normally selected one of said associated routers has become inoperational, and said selected higher level router selects the another of said associated routers to provide the same communication route.

36. (canceled)

37. (currently amended) A communication network comprising:

- a host network;
- a plurality of base stations;
- at least a mobile host capable of establishing links to said base stations; and
- a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network,

wherein at least one of said routers is a multicast router that transfers a packet to not only a first base station that is currently linked to said mobile host but also

transfers the packet to at least a second base station that is adjacent to said first base station and not currently linked to said mobile host,

wherein said multicast router adds said packet with a label value which indicates a sequence in transmission of said packet before transferring said packet with said label value.

38. (original) The communication network as claimed in claim 37, wherein said router selected as said multicast router is positioned at a branch point of both a currently designated communication route between said host network and said first base station and a currently undesignated adjacent communication route between said host network and said second base station.

39. (original) The communication network as claimed in claim 38, wherein said selection of said multicast router is made by a retrieval to said branch point based on a position recording message from said mobile host and a last-updated routing information stored on a routing table of each of said routers, wherein said routing information is updated based on said position recording message from said mobile host.

40. (original) The communication network as claimed in claim 39, wherein said retrieval to said branch point is made, every when said mobile host moves to an adjacent radio area to said last-existed radio area, based on a new position

recording message from said mobile host and a newly-updated routing information.

41. (original) The communication network as claimed in claim 37, wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and is positioned on a currently designated communication route between said host network and said first base station.

42. (currently amended) ~~The communication network as claimed in claim 41,~~ A communication network comprising:

a host network;

a plurality of base stations;

at least a mobile host capable of establishing links to said base stations; and

a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network,

wherein at least one of said routers is a multicast router that transfers a packet to not only a first base station that is currently linked to said mobile host but also transfers the packet to at least a second base station that is adjacent to said first base station and not currently linked to said mobile host,

wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and

is positioned on a currently designated communication route between said host network and said first base station, and

wherein said multicast router transfers said packet to said first base station and also to said second base station through a higher level router which is higher in level of said hierarchy-network of plural routers, provided that said higher level router is positioned at a branch point of both said currently designated communication route between said host network and said first base station and a currently undesignated adjacent communication route between said host network and said second base station.

43. (currently amended) ~~The communication network as claimed in claim 37,~~ A communication network comprising:

a host network;

a plurality of base stations;

at least a mobile host capable of establishing links to said base stations; and

a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network,

wherein at least one of said routers is a multicast router that transfers a packet to not only a first base station that is currently linked to said mobile host but also transfers the packet to at least a second base station that is

adjacent to said first base station and not currently linked
to said mobile host,

wherein said second base station is selected to be a base station which transmits a most intensive radio wave to said mobile host except for said first base station.

44. (canceled)

45. (currently amended) The communication network as claimed in claim [[44]]37, wherein lowest level routers at the lowest level of said hierarchy-network of plural routers are capable of queuing said packet.

46. (original) The communication network as claimed in claim 45, wherein after said mobile host entered into said adjacent radio area and established a new link to said second base station, then said mobile host sends said second base station said label value which had been last-received from said first base station, and said second base station transfers said label value to said lowest level router, and said lowest level router selects at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and said lowest level router sends said selected at least one packet of said packets to said mobile host through said second base station.

47. (currently amended) The communication network as claimed in claim [[44]]37, wherein said mobile host compares a

just-received label value of said packet just received from said second base station to said last-received label value, and if said just-received label value is identical with said last-received label value, then said mobile host discards said packet just received from said second base station.

48. (currently amended) The communication network as claimed in claim ~~[[44]]~~37, wherein said second base station queues said packet.

49. (original) The communication network as claimed in claim 48, wherein after said mobile host entered into said adjacent radio area and established a new link to said second base station, then said mobile host sends said second base station said label value which had been last-received from said first base station, and said second base station selects at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and said second base station sends said selected at least one packet to said mobile host.

50. (currently amended) The communication network as claimed in claim ~~[[37]]~~37, wherein said multicast router is a bicast router.

51. (currently amended) A communication network comprising:

a host network;

a plurality of base stations;

at least a mobile host capable of establishing links to said base stations; and

a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network,

wherein said hierarchy-network of plural routers establishes not only a currently designated communication route between said host network and a first base station that is currently linked to said mobile host but also a currently undesignated adjacent communication route between said host network and a second base station that is adjacent to said first base station and not currently linked to said mobile host, [[and]]

wherein said hierarchy-network of plural routers transfers a packet not only through said currently designated communication route to said first base station but also transfers the packet through said currently undesignated adjacent communication route to said second base station,

wherein a router positioned at a branch point of both said currently designated communication route and said currently undesignated adjacent communication route is selected to perform as a multicast router, and

wherein said multicast router adds said packet with a label value which indicates a sequence in transmission of said packet before transferring said packet with said label value.

52. (canceled)

53. (currently amended) The communication network as claimed in claim ~~[[52]]~~51, wherein said selection of said multicast router is made by a retrieval to said branch point based on a position recording message from said mobile host and a last-updated routing information stored on a routing table of each of said routers, wherein said routing information is updated based on said position recording message from said mobile host.

54. (original) The communication network as claimed in claim 53, wherein said retrieval to said branch point is made, every when said mobile host moves to an adjacent radio area to said last-existed radio area, based on a new position recording message from said mobile host and a newly-updated routing information.

55. (currently amended) The communication network as claimed in claim ~~[[52]]~~51, wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and is positioned on a currently designated communication route between said host network and said first base station.

56. (original) The communication network as claimed in claim 55, wherein said multicast router transfers said packet to said first base station and also to said second base station through a higher level router which is higher in level

of said hierarchy-network of plural routers, provided that said higher level router is positioned at a branch point of both said currently designated communication route between said host network and said first base station and a currently undesignated adjacent communication route between said host network and said second base station.

57. (original) The communication network as claimed in claim 51, wherein said second base station is selected to be a base station which transmits a most intensive radio wave to said mobile host except for said first base station.

58. (canceled)

59. (currently amended) The communication network as claimed in claim ~~[[58]]~~51, wherein lowest level routers at the lowest level of said hierarchy-network of plural routers are capable of queuing said packet.

60. (original) The communication network as claimed in claim 59, wherein after said mobile host entered into said adjacent radio area and established a new link to said second base station, then said mobile host sends said second base station said label value which had been last-received from said first base station, and said second base station transfers said label value to said lowest level router, and said lowest level router selects at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and

said lowest level router sends said selected at least one packet of said packets to said mobile host through said second base station.

61. (currently amended) The communication network as claimed in claim ~~[[58]]~~51, wherein said mobile host compares a just-received label value of said packet just received from said second base station to said last-received label value, and if said just-received label value is identical with said last-received label value, then said mobile host discards said packet just received from said second base station.

62. (currently amended) The communication network as claimed in claim ~~[[58]]~~51, wherein said second base station queues said packet.

63. (original) The communication network as claimed in claim 62, wherein after said mobile host entered into said adjacent radio area and established a new link to said second base station, then said mobile host sends said second base station said label value which had been last-received from said first base station, and said second base station selects at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and said second base station sends said selected at least one packet to said mobile host.

64. (currently amended) The communication network as claimed in claim [[52]]51, wherein said multicast router is a bicast router.

65. (currently amended) A method of controlling a communication network that includes a host network; a plurality of base stations; at least a mobile host capable of establishing links to said base stations; and a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network, the method comprising the steps of:

~~wherein~~ transferring by at least one of said routers that is a multicast router ~~that transfers~~ a packet to ~~not only~~ a first base station that is currently linked to said mobile host;

~~but also transfers~~ the at least one of said routers also transferring the packet to at least a second base station that is adjacent to said first base station not currently linked to said mobile host; and

~~wherein~~ adding by said multicast router ~~adds to~~ said packet ~~with~~ a label value which indicates a sequence in transmission of said packet before transferring said packet with said label value.

66. (original) The method as claimed in claim 65, wherein said router selected as said multicast router is positioned at a branch point of both a currently designated communication

route between said host network and said first base station and a currently undesignated adjacent communication route between said host network and said second base station.

67. (original) The method as claimed in claim 66, wherein said selection of said multicast router is made by a retrieval to said branch point based on a position recording message from said mobile host and a last-updated routing information stored on a routing table of each of said routers, wherein said routing information is updated based on said position recording message from said mobile host.

68. (original) The method as claimed in claim 67, wherein said retrieval to said branch point is made, every when said mobile host moves to an adjacent radio area to said last-existed radio area, based on a new position recording message from said mobile host and a newly-updated routing information.

69. (original) The method as claimed in claim 65, wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and is positioned on a currently designated communication route between said host network and said first base station.

70. (currently amended) ~~The method as claimed in claim 69,~~ A method of controlling a communication network that includes a host network; a plurality of base stations; at least a mobile host capable of establishing links to said base stations; and a hierarchy-network of plural routers providing

multiple-point routings between said base stations and said host network, the method comprising the steps of:

transferring by at least one of said routers that is a multicast router a packet to a first base station that is currently linked to said mobile host, wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and is positioned on a currently designated communication route between said host network and said first base station;

the at least one of said routers also transferring the packet to at least a second base station that is adjacent to said first base station not currently linked to said mobile host; and

wherein the steps of transferring said~~multicast router transfers~~ said packet to said first base station and also to said second base station each comprise the step of transferring through a higher level router which is higher in level of said hierarchy-network of plural routers, provided that said higher level router [[is]] being positioned at a branch point of both said currently designated communication route between said host network and said first base station and a currently undesignated adjacent communication route between said host network and said second base station.

71. (currently amended) ~~The method as claimed in claim~~
657 A method of controlling a communication network that

includes a host network; a plurality of base stations; at least a mobile host capable of establishing links to said base stations; and a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network, the method comprising the steps of:

transferring by at least one of said routers that is a multicast router a packet to a first base station that is currently linked to said mobile host;

the at least one of said routers also transferring the packet to at least a second base station that is adjacent to said first base station not currently linked to said mobile host; and.

selecting ~~wherein~~ said second base station ~~is selected~~ to be a base station which transmits a most intensive radio wave to said mobile host except for said first base station.

72. (canceled)

73. (currently amended) The method as claimed in claim [[72]]65, wherein lowest level routers at the lowest level of said hierarchy-network of plural routers are capable of queuing said packet.

74. (currently amended) The method as claimed in claim 73, ~~wherein~~ further comprising the steps of, after said mobile host entered into said adjacent radio area and established a new link to said second base station, ~~then~~

said mobile host ~~sends~~ sending said second base station said label value which had been last-received from said first base station, [[and]]

said second base station ~~transfers~~ transferring said label value to said lowest level router, [[and]] said lowest level router ~~selects~~ selecting at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and

said lowest level router ~~sends~~ sending said selected at least one packet of said packets to said mobile host through said second base station.

75. (currently amended) The method as claimed in claim [[72]]65, further comprising the steps of ~~wherein~~ said mobile host ~~compares~~ comparing a just-received label value of said packet just received from said second base station to said last-received label value, and if said just-received label value is identical with said last-received label value, ~~then~~ said mobile host ~~discards~~ discarding said packet just received from said second base station.

76. (currently amended) The method as claimed in claim [[72]]65, wherein said second base station queues said packet.

77. (currently amended) The method as claimed in claim 76, ~~wherein after~~ further comprising the steps of said mobile host ~~entered~~ entering into said adjacent radio area and ~~established~~ establishing a new link to said second base

station, then said mobile host ~~sends~~ sending said second base station said label value which had been last-received from said first base station, and said second base station ~~selects~~ selecting at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and said second base station ~~sends~~ sending said selected at least one packet to said mobile host.

78. (original) The method as claimed in claim 65, wherein said multicast router is a bicast router.

79. (currently amended) A method of controlling a communication network that includes a host network; a plurality of base stations; at least a mobile host capable of establishing links to said base stations; and a hierarchy-network of plural routers providing multiple-point routings between said base stations and said host network, the method comprising the steps of:

~~wherein~~ establishing by said hierarchy-network of plural routers ~~establishes not only~~ a currently designated communication route between said host network and a first base station that is currently linked to said mobile host;

~~but also~~ establishing by said hierarchy-network of plural routers a currently undesignated adjacent communication route between said host network and a second base station that is

adjacent to said first base station and not currently linked to said mobile host[[, and]];

~~wherein~~ transferring by said hierarchy-network of plural routers ~~transfers~~ a packet ~~not only~~ through said currently designated communication route to said first base station;

~~but also transfers~~ transferring by said hierarchy-network of plural routers the packet through said currently undesignated adjacent communication route to said second base station;

selecting a router positioned at a branch point of both said currently designated communication route and said currently undesignated adjacent communication route to perform as a multicast router; and

adding by said multicast router to said packet a label value which indicates a sequence in transmission of said packet before transferring said packet with said label value.

80. (canceled)

81. (currently amended) The method as claimed in claim [[80]]79, wherein said step of selecting ~~selection of~~ said multicast router is made by a retrieval to said branch point based on a position recording message from said mobile host and a last-updated routing information stored on a routing table of each of said routers, and further comprising the step of updating ~~wherein~~ said routing information ~~is updated~~ based on said position recording message from said mobile host.

82. (currently amended) The method as claimed in claim 81, wherein said retrieval to said branch point is made ~~every when~~ each time said mobile host moves to an adjacent radio area to said last-existed radio area, based on a new position recording message from said mobile host and a newly-updated routing information.

83. (currently amended) The method as claimed in claim [[80]]79, wherein said router selected as said multicast router has a lowest level in said hierarchy-network of plural routers and is positioned on a currently designated communication route between said host network and said first base station.

84. (original) The method as claimed in claim 83, wherein said multicast router transfers said packet to said first base station and also to said second base station through a higher level router which is higher in level of said hierarchy-network of plural routers, provided that said higher level router is positioned at a branch point of both said currently designated communication route between said host network and said first base station and a currently undesigned adjacent communication route between said host network and said second base station.

85. (original) The method as claimed in claim 79, wherein said second base station is selected to be a base station

which transmits a most intensive radio wave to said mobile host except for said first base station.

86. (canceled)

87. (currently amended) The method as claimed in claim [[86]]79, wherein lowest level routers at the lowest level of said hierarchy-network of plural routers are capable of queuing said packet.

88. (currently amended) The method as claimed in claim 87, ~~wherein after~~ further comprising the steps of,

said mobile host ~~entered~~ entering into said adjacent radio area and ~~established~~ establishing a new link to said second base station, ~~then~~

said mobile host ~~sends~~ sending said second base station said label value which had been last-received from said first base station, [[and]]

said second base station ~~transfers~~ transferring said label value to said lowest level router, [[and]]

said lowest level router ~~selects~~ selecting at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and

said lowest level router ~~sends~~ sending said selected at least one packet of said packets to said mobile host through said second base station.

89. (currently amended) The method as claimed in claim [[86]]79, ~~wherein~~ further comprising the steps of said mobile host ~~compares~~ comparing a just-received label value of said packet just received from said second base station to said last-received label value, and if said just-received label value is identical with said last-received label value, ~~then~~ said mobile host ~~discards~~ discarding said packet just received from said second base station.

90. (currently amended) The method as claimed in claim [[86]]79, wherein said second base station queues said packet.

91. (currently amended) The method as claimed in claim 90, ~~wherein after~~ further comprising the steps of said mobile host ~~entered~~ entering into said adjacent radio area and ~~established~~ establishing a new link to said second base station, ~~then~~ said mobile host ~~sends~~ sending said second base station said label value which had been last-received from said first base station, [[and]] said second base station ~~selects~~ selecting at least one packet from queuing packets by comparing respective label values of said queuing packets with reference to said last label value, and said second base station ~~sends~~ sending said selected at least one packet to said mobile host.

92. (currently amended) The method as claimed in claim [[80]]79, wherein said multicast router is a bicast router.